REMARKS

Claims 1-12 and 22-25 are now in the application. Claim 1 has been amended to recite that the quantity of the polyelectrolyte is in excess of the amount which adsorbs an abrasive particle and is present as free or unabsorbed polyelectrolyte as disclosed in the specification at page 4, lines 17-20. Moreover, Claim 1 has been amended to recite that the polyelectrolyte is an anionic polyelectrolyte when the polish composition is for selectively polishing silicon dioxide as compared to silicon nitride or is a cationic polyelectrolyte when the polish composition is for selectively polishing metals as compared to silicon dioxide, silicon nitride and/or silicon oxynitride as disclosed in the specification at page 4, lines 13-16. New claims 22 and 23 find support at page 5, lines 1-3. New claims 24 and 25 find support at page 6, lines 5 and 6.

Claims 1-12 were rejected under 35 USC 102/(b) as being anticipated by or under 35 USC 103(a) as being obvious over U.S. Patent 5,876,490 to Ronay (the inventor of the claims in this application). U.S. Patent 5,876,490 fails to anticipate and fails to render obvious claims 1-12.

The present invention provides polishing compositions for increasing the polishing ratio of silicon dioxide to silicon nitride by including an anionic polyelectrolyte in the polishing composition (see page 3, lines 8-9). Another aspect of the present invention provides polishing compositions for increasing the ratio of a metal to silicon dioxide, silicon nitride, and/or silicon oxynitride by including a cationic polyelectrolyte in the polishing composition (see page 3, lines 10-12). According to the present invention, as discussed in paragraph bridging pages 4 and 5 of the specification, in order to achieve increased selectivity of polishing, the quantity of polyelectrolytes in the abrasive composition is in excess of the amount which adsorbs on the surface of the abrasive particles and therefore is present in the composition as free or unabsorbed polyelectrolytes. It is believed that the position of the polyelectrolyte in the supernatant portion of the slurry controls the polishing rate selectivity (see page 5, lines 5-6). Claim 1 has been amended to reflect these aspects.

Ronay fails to anticipate or render obvious claims 1-12 since, among other things, Ronay does not suggest providing free polyelectrolyte in the compositions. The free polyelectrolyte is important for controlling the polishing rate selectivity as discussed above. On the other hand, compositions in Ronay contain excess abrasive particles. In other words, compositions in Ronay

contains abrasive particles that remain unrelated (see column 3, line 64 to column 4, line 4; column 4, lines 5-10; column 4, lines 18-21; column 5, lines 14-18; column 7, lines 50-52).

More particularly, compositions of U.S. Patent 5,876,490 are intended for planarizing microelectronics structures by having a fraction of the abrasive particles coated with a polyelectrolyte, which do not polish, while the rest of the particles remain uncoated and do polish (the coated particles segregate in the "down" areas (valleys), thereby preventing polishing there, while the uncoated particles polish the "up" areas (hills), thereby enhancing planarization). Therefore, employing excess polyelectrolyte would be contrary to these objectives.

Moreover, U.S. Patent 5,876,490 does not suggest selecting the type of polyelectrolyte depending upon the desired polishing selectivity as recited in claim 1.

Ronay does not disclose that use of the slurry compositions therein could or should be used in to enhance the polishing rate ratio of silicon dioxide to silicon nitride or the polishing rate ratio of metal to silicon dioxide, silicon nitride and/or silicon oxynitride depending upon the type of polyelectrolyte employed. The disclosure of Ronay does not discuss this polishing selectivity. Accordingly, persons skilled in the art faced with the problems addressed by the present invention would not be lead by Ronay on how to solve the selectivity problem. Furthermore, since achieving the results obtainable by the present inventions is extremely significant, if such were obvious it seems apparent that such would have been disclosed by Ronay.

Claims 1, 2, 6, 8, 10, 11 and 12 were rejected under 35 USC 102(b) as being anticipated by or under 35 USC 103(a) as being obvious over under 35 USC 103(a) over U.S. Patent 5,860,848 to Loncki.

Loncki fails to anticipate or render obvious claims 1, 2, 6, 8, 10, 11 and 12 since among other things, Loncki does not suggest providing free polyelectrolyte in the compositions. The free polyelectrolyte is important for controlling the polishing rate selectivity as discussed above. On the other hand, compositions therein contain very small amounts of polyelectrolyte of 20 - 500 ppm. The polyelectrolyte is used as a dispersion agent to prevent the abrasive particles from adhering to the wafer during post polish cleaning operations (see column 5, lines 27-30). In fact, Loncki teaches away from using increased amounts of polyelectrolyte at column 5, lines 40-44.

Contrary to the affect achievable by the present invention, Loncki at column 5, lines 30-32 states that "this class of dispersion agent has been shown not to interfere with the polishing process" (emphasis mine). In other words, at the low concentration required therein, the polyelectrolytes do not affect selective polishing. Employing excess polyelectrolyte would be contrary to the objectives of Loncki.

Moreover, U.S. Patent 5,860,848 does not suggest selecting the type of polyelectrolyte depending upon the desired polishing selectivity as reacted in claim 1. Loncki does not disclose that use of the slurry compositions therein could or should be used to enhance the polishing rate ratio of silicon dioxide to silicon nitride or the polishing rate ratio of metal to silicon dioxide, silicon nitride and/or silicon oxynitride depending upon the type of polyelectrolyte employed. The disclosure of Loncki does not discuss this polishing selectivity. Accordingly, persons skilled in the art faced with the problems addressed by the present invention would not be lead by Loncki on how to solve the selectivity problem.

Claims 1, 2 and 10-12 were rejected under 35 USC 102(e) as being anticipated by or under 35 USC 103(a) as being obvious over as being unpatentable over U.S. Patent 6,253,140 to Shemo et al. U.S. Patent 6,258,140 to Shemo et al. fails to anticipate and fails to render obvious claim 1, 2 and 10-12 since, among other things, Shemo et al. fail to suggest providing free polyelectrolyte in the composition for controlling the polishing rate selectivity as discussed above. On the other hand, compositions therein contain polyelectrolyte for reducing "chattering" between the carrier and hard disk during polishing of the disk.

U.S. Patent 6,258,140 does not suggest selecting the type of polyelectrolyte dependency upon a desired polishing selectivity as recited in claim 1. Shemo et al. does not disclose that use of the slurry compositions therein could or should be used to enhance the polishing rate ratio of silicon dioxide to silicon nitride or the polishing rate ratio of metal to silicon dioxide, silicon nitride and/or silicon oxynitride depending upon the type of polyelectrolyte employed. The disclosure of Shemo et al. does not discuss this polishing selectivity. Accordingly, persons skilled in the art faced with the problems addressed by the present invention would not be lead by Shemo et al. on how to solve the selectivity problem.

Claims 3-9 were rejected under USC 103(a) as being obvious over Shemo et al. in view of U.S. Patent 5,896,490 to Ronay. U.S. Patent 5,896,490 does not overcome the above discussed deficiencies of Shemo et al. with respect to rendering unpatentable the present claims.

As discussed above, Ronay does not disclose the use of the slurry compositions therein that contain an anionic polyelectrolyte could or should be used in a polishing process to enhance the polishing rate ratio of silicon dioxide to silicon nitride. Also, discussed above, Ronay does not disclose the use of the slurry compositions therein that contain a cationic polyelectrolyte could or should be used in a polishing process to enhance the polishing rate ratio of metal to silicon dioxide, silicon nitride and/or silicon oxynitride. The disclosure of Ronay does not discuss polishing selectivity. Accordingly, persons skilled in the art faced with the problems addressed by the present invention would not be lead by Ronay on how to solve the selectivity problem. Furthermore, since achieving the results obtainable by the present invention is extremely significant, if such were obvious it seems apparent that such would have been disclosed by Ronay.

The cited references fail to anticipate the present invention. In particular, anticipation requires the disclosure, in a prior art reference, of each and every recitation as set forth in the claims. *See Titanium Metals Corp. v. Banner*, 227 USPQ 773 (Fed. Cir. 1985), *Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, 1 USPQ2d 1081 (Fed. Cir. 1986), and *Akzo N.V. v. U.S. International Trade Commissioner*, 1 USPQ2d 1241 (Fed. Cir. 1986).

There must be no difference between the claimed invention and reference disclosure for an anticipation rejection under 35 USC 102. *See Scripps Clinic and Research Foundation v. Genetech, Inc.*, 18 USPQ2d 1001 (CAFC 1991) and *Studiengesellschaft Kohle GmbH v. Dart Industries*, 220 USPQ 841 (CAFC 1984).

Concerning obviousness. *Graham v. John Deere*, 383 U.S. 1,148 USPQ 459 (1966) outlines the approach that must be taken when determining whether an invention is obvious. In *Graham*, the Court stated that a patent may not be obtained if the subject matter would have been obvious at the time the invention was made to a person having ordinary skill in the art, but emphasized that nonobviousness must be determined in the light of inquiry, not quality. Approached in this light, §103 permits, when followed realistically, a more practical test of

patentability. In accordance with Graham, three inquiries must be made in determining whether an invention is obvious:

(1) The scope and content of the prior art are to be determined;

(2) The difference between the prior art and the claims at issue are to be ascertained;

(3) The level of ordinary skill in the pertinent are resolved.

Against this background, the obviousness or nonobviousness of the subject matter is determined. Secondary considerations, such as commercial success, long felt but unsolved needs, failure of others, etc., can be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.

In conjunction with interpreting 35 USC §103 under *Graham*, the initial burden is on the Examiner to provide some suggestions of the desirability of doing what the inventor did, i.e., the Examiner must establish a *prima facie* case of obviousness. To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention, or the Examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references.

To establish a prima *facie case* of obviousness, three basic criteria must be met:

1. There must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference.

2. There must be a reasonable expectation of success.

3. The prior art reference (or references when combined) must teach or suggest all the claim recitations.

The teaching or suggestion the reasonable expectation of success must both be found in the prior art and not based on Applicants' disclosure. *In re Vaeck*, 947 F2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). See MPEP § 2143 - § 2143.03 for decisions pertinent to each of these criteria.

The discussion in *In re Kotzab*, 55 USPQ2d 1313 (Fed. Cir. 2000) at page 1317 is also relevant wherein the Court stated:

> A critical step in analyzing the patentability of claims pursuant to section 103(a) is casting the mind back to the time of invention, to consider the thinking of one of ordinary skill in the art, guided by the prior art references and the then-accepted wisdom in the field. *See Dembiczak*, 175 F.3d at 990, 50 ISPQ2d at 1617. Close adherence to this methodology is especially important in cases where the very ease with which the invention can be understood may prompt one "to fall victim to the insidious effect of a hindsight syndrome wherein that which only the invention taught is used against its teacher. Id. (quoting W.L. Gore & Assoc., Inc. v. Garlock, Inc. 721 F.2d 1540, 1553, 220 USPQ 303,313 (Fed. Cir. 1983).

The mere fact that the cited art may be modified in the manner suggested by the Examiner does not make this modification obvious, unless the cited art suggest the desirability of the modification. No such suggestion appears in the cited art in this matter. The Examiner's attention is kindly directed to *In re Lee* 61 USPQ2d 1430 (Fed. Cir. 2002), In re *Dembiczak et al.* 50 USPQ2d 1614 (Fed. Cir. 1999), *In re Gordon*, 221 USPQ 1125 (Fed. Cir. 1984), *In re Laskowski*, 10 USPQ2d. 1397 (Fed. Cir. 1989) and *In re Fritch*, 23, USPQ2d. 1780 (Fed. Cir. 1992).

In Dembiczak et al., supra, the Court at 1617 stated:

> Our case law makes clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references. See e.g. C.R. Bard, Inc. v. M3 Sys., Inc., 157 F.3d. 1340, 1352, 48 USPQ2d. 1225, 1232 (Fed. Cir. 1998) (describing 'teaching or suggestion motivation [to combine]' as in 'essential evidentiary component of an obviousness holding'), In re Rouffet, 149 F.3d 1350, 1359, 47 USPQ2d. 1453, 1459 (Fed. Cir. 1998) ('the Board must identify specifically ... the reasons one of ordinary skill in the art would have been motivated to select the references and combine them'); ...

Also, the cited art lacks the necessary direction or incentive to those of ordinary skill in the art to render under 35 USC 103 sustainable. The cited art fails to provide the degree of predictability of success of achieving the properties attainable by the present invention needed to sustain a rejection under 35 USC 103. See *Diversitech Corp. v. Century Steps, Inc.* 7 USPQ2d 1315 (Fed. Cir. 1988), *In re Mercier*, 187 USPQ 774 (CCPA1975) and *In re Naylor*, 152 USPQ 106 (CCPA 1996).

Moreover, the properties of the subject matter and improvements which are inherent in the claimed subject matter and disclosed in the specification are to be considered when evaluating the question of obviousness under 35 USC 103. See *Gillette Co. v. S.C. Johnson &*

Son, Inc. 16 USPQ2d 1923 (Fed. Cir. 1990), *In re Antonie*, 195, USPQ 6 (CCPA 1977), *In re Estes*, 164 USPQ (CCPA 1970), and *In re Papesch*, 137 USPQ 43 (CCPA 1963).

No property can be ignored in determining patentability and comparing the claimed invention to the cited art. Along these lines, see *In re Papesch*, supra, *In re Burt et al.*, 148 USPQ 548 (CCPA 1966), *In re Ward*, 141 USPQ 227 (CCPA 1964), and *In re Cescon*, 177 USPQ 264 (CCPA 1973).

The present invention could only be derived from the cited art by the use of "hindsight," i.e., by knowing what Applicants' invention was in advance from Applicants' disclosure, and then *ex post facto* reconstructing Applicants' invention from the prior art after a thorough search. The prior art does not lead persons of ordinary skill in the art to discover a process for enhancing polishing rate ratio of silicon dioxide to silicon nitride or of metal to silicon dioxide, silicon nitride and/or silicon oxynitride. It is impermissible under 35 USC 103 to use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. See *In re Fine*, 5 USPQ2d 1596 (Fed. Cir. 1988). Furthermore, it is well settled that hindsight reconstruction using the patent application as a guide through the maze of prior art references, combining "the right references in the right way" so as to achieve the result of the claimed invention must be avoided. See *Grain Processing Corp. v. American Maize-Products Corp.*, 5 USPQ2d 1788 (Fed. Cir. 1988).

The comments made by the Court in *Air-vend, Inc. Throne Industries, Inc.* 229 USPQ 505 at 515 (District Court, Minnesota, 1985) are appropriate here:

> The question of obviousness, as the Court of Appeals for the Federal Circuit has acknowledged, is simple to ask, but difficult to answer ... The difficulty in answering this question is due in no small part to the strong temptation to resort to and rely on hindsight in formulating the answer. Hindsight, however, is quite improper when resolving the question obviousness. To use the patent in suit as a guide through the prior art references, combining the right references in the right way to arrive at the result of the claims in the suit is, therefore, also quite improper. Combining the teachings of the prior art to produce the claimed invention absent some teaching, suggestion or incentive supporting this combination cannot establish obviousness.
> The rejection of the claims is in the nature of "ought to be tried" which is an

impermissible standard under USC 103 (see *Jones v. Hardy*, 220 USPQ 1021 [CAFC 1984].

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In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

The Director is hereby authorized to charge any fees, or credit any overpayment, associated with this communication, including any extension fees to CBLH Deposit Account No. 22-0185.

Dated: May 20, 2004

Respectfully submitted,

By _____

Burton A. Amernick,
Registration No.: 24,852
CONNOLLY BOVE LODGE & HUTZ LLP
1990 M Street, N.W., Suite 800
Washington, DC 20036-3425
(202) 331-7111
(202) 293-6229 (Fax)